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NEW HAMPSHIRE
AGRICULTURAL EXPERIMENT STATION

DEPARTMENT OF CHEMISTRY

Analyses of Feeding Stuffs and Fertilizers

MADE FOR THE
STATE BOARD OF AGRICULTURE

1908

FRED W. MORSE and BERT E. CURRY

NEW HAMPSHIRE COLLEGE
OF
AGRICULTURE AND THE MECHANIC ARTS
DURHAM, N. H.

AVERAGE COMPOSITION OF COMMON CATTLE FOODS.

	Water.	Ash.	Protein.	Soluble Carbohydrates.	Fibre.	Fat.
* Hay, red top	8.9	5.2	7.9	47.4	28.6	1.9
* Hay, Timothy	13.2	4.4	5.9	45.0	29.0	2.5
* Hay, clover	15.3	6.2	12.3	38.1	24.8	3.3
* Hay, Hungarian	7.7	6.0	7.5	49.0	27.7	2.1
* Oat fodder	8.9	6.2	7.6	45.1	29.3	2.8
* Rye fodder, in bloom	8.5	5.9	9.7	43.4	30.2	2.3
* Corn stover	40.1	3.4	3.8	31.9	19.7	1.1
† Corn silage	80.5	1.5	1.6	10.0	5.8	0.6
* Corn, N. H. Flint	10.1	1.5	11.6	70.2	1.1	5.5
* Corn, Western Dent	10.6	1.5	10.3	70.4	2.2	5.0
* Corn meal	15.0	1.4	9.2	68.7	1.9	3.8
¶ Hominy feed	9.0	2.8	11.0	65.0	3.6	8.6
* Oats, whole	11.0	3.0	11.8	59.7	9.5	5.0
¶ Corn and oats, pure	12.0	2.2	9.8	68.5	3.3	4.2
§ Wheat bran, spring	10.6	6.0	16.3	53.0	9.4	4.7
§ Wheat bran, winter	11.7	5.9	15.2	54.8	8.5	3.9
¶ Wheat middlings, white	11.3	2.7	15.8	62.5	3.5	4.2
¶ Wheat middlings, brown	10.6	3.8	17.8	57.0	5.5	5.3
¶ Wheat feed	10.8	4.3	17.0	58.1	5.1	4.7
¶ Gluten feed	8.6	1.2	26.3	53.4	6.9	3.6
¶ Gluten meal	8.8	0.7	35.5	50.3	1.6	3.1
‡ Distillers' Grains	8.8	1.8	32.1	34.9	11.0	11.4
‡ Brewers' Grains	8.0	3.8	23.1	49.4	10.8	4.9
‡ Malt sprouts	11.0	5.8	27.1	42.6	11.9	1.6
¶ Linseed meal, old process	9.8	5.5	33.9	35.7	7.3	7.8
¶ Linseed meal, new process	9.1	5.8	35.2	38.4	8.5	3.0
¶ Cottonseed meal	6.9	7.2	44.6	25.1	5.6	10 6

* Composition of American Feeding Stuffs. Jenkins and Winton.
† Analyses made at the N. H. Expt. Sta., 1895-1899.
§ Penn. Expt. Sta. Bull. 48.
¶ Compiled from Feed Inspection Reports of various states.
‡ Hatch Expt. Sta. Bull., No. 94.

ANALYSES OF FEEDING STUFFS AND FERTILIZERS

ANALYSES OF FEEDING STUFFS.

All samples included in the following tables were collected by Mr. A. J. Richardson as agent for the State Board of Agriculture. A few samples received from farmers are mentioned, but are not tabulated with the official ones.

The wheat by-product known as "Mixed Feed" was given especial attention this year, since it is the most widely used of any of the concentrated feeds by the farmers of this state. Seventeen different brands were sampled, and represented the feed as sold in all sections of the state. Half of the lots bore no guarantee of protein and fat, but all were above 15 per cent. in protein and 4 per cent. in fat content. From this standpoint they were all standard material and contained no admixture of corn cob, as some goods have shown in past years.

A microscopical examination of these feeds showed several to contain weed seeds and one sample was found to contain finely cracked corn. Kehlor, Snowflake and Woolcott brands were most noticeable for the weed seeds, which were sufficiently numerous to indicate the use of screenings. It has always been the opinion of this department that it is more economical to purchase bran and middlings, than to purchase mixed feed, on account of both cost and quality.

The mixture of coarse and fine material in one product renders concealment of impurities easy, and there is always a great preponderance of the cheaper by-product in it.

There were also received from farmers a sample of bran from Laconia and a sample of mixed feed from Alton. In the bran was a large proportion of brewers' grains, while the mixed feed contained a quantity of kaffir corn, partially crushed. Neither lot was branded in any way.

The list of mixed feeds and their composition follows:

WHEAT MIXED FEEDS.

Manufacturer and Brand.	Protein.		Fat.	
	Found.	Guaranteed.	Found.	Guaranteed.
Everett Augsburgh, Waseca, Minn.				
Echo Mixed Feed	15.81	15.	5.31	3.
Chapin & Co. No brand	15.77	.....	4.41	.....
Flint Milling Co., Chapin & Co., Agents.				
Vermont Mixed Feed	16.73	14.	5.26	4.
Cressy & Co., Agents, Concord, N. H.				
Pillsbury Mixed Feed	16.59	15.	4.89	4.5
Griswold & McKinnon, St. Johnsbury, Vt.				
Lancaster Mixed Feed	15.83	.....	5.39	.....
X-tragood Mixed Feed	15.71	.....	4.06	.....
Holland O'Neil Milling Co., Mt. Vernon, Mo.				
Cremo Mixed Feed	17.72	15.	4.55	4.50
Kahlor Flour Mills, St. Louis.				
Kahlor Mixed Feed	15.56	14.	4.73	4.
Lawranceburg Roller Mills, Lawrenceburg, Ind.				
Snowflake Mixed Feed	15.09	.....	4.28	.....
Northwestern Consolidated Milling Co., Minneapolis, Minn.				
Mixed Feed	16.30	17.	5.39	4.75
Pillsbury-Washburn Co., Minneapolis.				
Pillsbury Fancy Mixed Feed	15.50	14.	4.36	4.50
Henry Russell & Co., Buffalo.				
Russell's Regular Wheat Feed	16.67	.....	5.37	.....
Russell Miller Milling Co., North Dakota.				
Occident Mixed Feed	16.45	.....	4.87	.....
St. Albans Grain Co., St. Albans, Vt.				
Winnipesaukee Mixed Feed	16.10	16.	4.87	4.
Stratton & Co., Concord, N. H.				
Rowell's Fancy Mixed Feed	15.75	.....	4.58	.....
Thornton Chester Milling Co., Buffalo.				
Mixed Wheat Feed	16.76	.....	5.36	.....
Wagoner Milling Co., Independence, Mo.				
Mixed Feed	15.77	.....	4.28	.....
Wolcott's Mills, Harrisburg, Ill.				
Wolcott's Mixed Feed	15.10	.....	4.50	.....

Cottonseed and linseed meals were of good quality in all official samples. Two samples of cottonseed meal from Walpole and one from Tilton were received from buyers, who suspected the presence of hulls because of the dark color. In each case, however, the protein was found to be over 41 per cent. A sample of Dixie Brand Cottonseed Meal from Barrington, guaranteed to contain 41 per cent. protein, was found to contain 38 per cent. In this case the manufacturers gave a rebate, which is in accord with their statement on the tags of this brand of meal.

The results found on this group of feeds are in the following table:

COTTONSEED MEAL.

Manufacturer and Brand.	Protein.		Fat.	
	Found.	Guaranteed.	Found.	Guaranteed.
F. W. Brodie & Co., Memphis.				
Owl Brand. Two samples	40.06	41.	10.77	7.
	42.73	.....	.....	.....
Humphry, Goodwin & Co., Memphis.				
Dixie Brand. Two samples	41.42	41.	10.37	9.
	43.13	.....	.....	.....
Hunter Bros. Milling Co., St. Louis.				
Prime Cotton Seed Meal. Two samples	44.93	41.	9.32	9.
	40 89	.....	.....	.....
Lindsay, Wells & Co., Memphis.				
Sun Brand	43.79	41.	8.72	9.
J. F. Walker, Memphis.				
Purity Brand	42.95	41.	8.36	9.

LINSEED MEAL.

Manufacturer and Brand.	Protein.		Fat.	
	Found.	Guaranteed.	Found.	Guaranteed.
American Linseed Co.				
Linseed Oil Meal. Three samples	33.19	36.	3.87	1.
	35.71	.....	2.11	.....
	35.75	.....	3.27	.....
Old Process Oil Meal	36.82	32.	6.04	5.

The group of by-products which comprises gluten feeds, distillers' grains, brewers' grains and hominy feeds were not very satisfactory in their agreement with the guarantees. But one brand of gluten feed and one of brewers' grains of this group equalled the guarantee of protein. The distillers' grains were sufficiently high in fat to offset the deficit in protein. The result of the analyses are on the following page.

The proprietary feeds, which are mixtures of various by-products, are increasing in numbers and are widely advertised. They may be likened to the mixed fertilizers. They contain protein and fat, but these nutrients are present in a variety of substances, and some of the cheapest mill refuse is used in their preparation, such as screenings from flour mills and linseed oil mills, oat hulls, rice hulls, flax fiber, corn cobs and so forth. Such fillers are of uncertain digestibility and most of them would be unpalatable to livestock if fed separately. In the

GLUTEN FEEDS, HOMINY FEEDS, DISTILLERS' AND BREWERS' GRAINS.

Manufactnrer and Brand.	Protein.		Fat.	
	Found.	Guaranteed.	Found.	Guaranteed.
Clinton Sugar Refining Co., Clinton, Iowa.				
Clinton Gluten Feed	19.79	23.	3.94	3.
Corn Products Refining Co.				
Warner's Gluten Feed	24.26	23.	4.03	2.5
Glucose Sugar Refining Co.				
Buffalo Gluten Feed	21.29	25.	2.66	2.5
J. E. Soper, Boston.				
Bay State Gluten Feed	22.55	24.	4.85	4.
J. W. Biles Co., Cincinnati.				
Biles's 4 X Distillers' Grains. Two samples.	30.45	33.	13.52	11.
	29.39	.....	14.46	.....
Hottelett & Co., Milwaukee.				
Holstein Feed (Brewers' Grains)	24.13	27.	6.87	6.
Schlitz, Milwaukee.				
Pure Dried Brewers' Grains	25.01	24.5	6.44	6.5
Buffalo Cereal Co., Buffalo.				
Hominy Feed	9.80	10.25	7.28	8.
Hunter Brothers' Milling Co., St. Louis.				
Hominy Feed	8.47	.....	5.56	.....

mixtures on the market, they are either saturated with molasses, seasoned with salt or mixed with concentrated material like oil meal, gluten feed and oat meal and thus rendered attractive to animals.

Is it profitable for our farmers to buy such mixtures? It is the opinion of this department that it is extravagant. Meadow hay and corn stover are superior to oat hulls or flax straw and weed seed is too abundant now in our fields. If such feeds are purchased it should be those with the highest percentages of protein and fat.

The poorest feeds in this class were found among the molasses feeds and the flax feeds. These contained many weed seeds, particularly the H-J flax feed, which was also far below its claims in percentages of both fat and protein.

The crude fiber in these materials shows clearly the use of coarse material as a part of the mixture. Sucrene Feed contained 12.1 per cent. fiber, Molac Dairy Feed 14.5 per cent. and H-J Flax Feed 10.7 per cent. No whole grains, except light weight oats, possess 10 per cent. of fiber, while no meals or by-products exceed this percentage except distillers' grains, which average about 11 per cent.

COMPOUND FEEDS.

Manufacturer and Brand.	Protein.		Fat.	
	Found.	Guaranteed.	Found.	Guaranteed.
J. W. Biles Co.				
Biles's Ready Ration or Union Grains, two samples	23.96	24.	7.43	7.
	22.81	.....	8.14	.....
Chas. M. Cox Co.				
Wirthmore Stock Feed	10.14	10.	8.78	4.
Flint Milling Co.				
Pearl Cooked Horse and Cow Feed	8.84	8.	4.54	3.
W. H. Haskell Co., Toledo.				
Haskell's Stock Feed	7.81	8.	6.72	4.
Proteina Mills, St. Louis.				
Proteina Dairy Feed	18.61	20.	5.41	3.5
Quaker Oat Co.				
Schumacher Stock Feed	10.18	10.	5.29	4.
Victor Corn and Oats	10.27	.....	3.74	.....
J. W. Barwell, Waukegan, Ill.				
Blatchford's Calf Meal	26.59	25.	4.42	5.
United Breeders Co. of America.				
Baum's Horse and Stock Food	19.70	.....	*3.00	.....

* Fat calculated after removal of sulphur.

MOLASSES FEEDS.

Manufacturer and Brand.	Protein.		Fat.	
	Found.	Guaranteed.	Found.	Guaranteed.
American Milling Co.				
Sucrene Dairy Feed	17.38	16.5	5.65	3.5
Quaker Oats Co.				
Molac Dairy Feed, two samples	13.34	15.5	4.42	3.
	13.51	.....	4.13	.....

FLAX FEED.

Manufacturer and Brand.	Protein.		Fat.	
	Found.	Guaranteed.	Found.	Guaranteed.
H. Jennings & Co., Boston.				
H-J Flax Feed, three samples	10.44	.....	9.89	.....
	13.16	17.	9.97	17.
	15.30	.....	11.99	.....

The poultry feeds on the market may be divided into two principal groups, one consisting entirely of animal matter;

and the other including the various mixtures, mashes and scratching feeds, some of which are wholly from cereals and others include both cereals and animal matter.

In the purchase of mashes, the buyer should scrutinize the material carefully for excess of fiber in the form of oat hulls or similar waste. H-O and American Poultry Foods contained respectively 5.50 per cent. and 4.50 per cent. of fiber, while Wirthmore Mash Feed contained 12 per cent. A glance at the three would show what might appear to be oats ground with the other material, but in the last case, not even light weight oats alone should show as much as 12 per cent. fiber; hence, oat hulls must be inferred as forming a part of the mixture.

POULTRY FEEDS.

Manufacturer and Brand. Animal Matter.	Protein.		Fat.	
	Found.	Guaranteed.	Found.	Guaranteed.
American Agricultural Chemical Co.				
Bradley's Superior Meat Meal	33.61	30.	16.92	5.
Darling's Bone Meal	23.78	.....	5.89	.....
Ground Beef Scraps	43.96	40.	15.93	15.
Armour & Co.				
Armour's Beef Scraps	60.10	.....	14.30	.....
Armour's Blood Meal	80.40	.....	1.74	.....
Beach Soap Co.				
Pure Ground Beef Scraps	40.27	40.	17.91	20.
Bowker Fertilizer Co.				
Bowker's Animal Meal	48.18	40.	9.75	5.
Hinckley Rendering Co.				
Beef Scraps, two samples	33.87	40.	12.69	10.
	35.36	.....	12.39	.....
George E. Marsh, Lynn, Mass.				
Marsh's Poultry Food	39.57	36.	9.60	8.
Swift's Lowell Fertilizer Co.				
Swift's Lowell Beef Scraps	40.36	40.	15.26	15.
Mixtures, Mashes, etc	.....	.....	.....	.....
C. M. Cox Co.				
Wirthmore Mash Feed	13.52	20.	5.04	3.6
Thomas W. Emerson.				
Emerson's Chick Feed	10.18	9.	4.07	4.
H-O Company.				
H-O Poultry Food	16.14	17.	5.72	5.50
W. K. Kimball, Rochester, N. H.				
Kimball's Poultry Food	20.01	.....	5.95	.....
Carroll S. Page, Hyde Park, Vt.				
Page's Perfected Poultry Food, two samples	20.27	24.	7.31	8.
	22.64	.....	7.68	.....
Quaker Oat Co.				
American Poultry Food	10.62	12.	5.72	3.5
Ralston Mills Co.				
Purina Alfalfa Meal	15.40	15.	3.19	1.5

ANALYSES OF FERTILIZERS.

All samples of commercial fertilizers were collected by Mr. A. J. Richardson as agent for the State Board of Agriculture. The list of licensed brands remains about the same from year to year and, therefore, there are each year about one hundred brands collected and analyzed.

A number of brands have a limited sale and are missed some years, while others are found generally distributed over the state.

The noticeable feature of the fertilizers this year was the number of brands which were slightly low in nitrogen. In the majority of such instances, the valuation of the fertilizer was made good by an excess in either phosphoric acid or potash.

This depression in nitrogen was most noticeable in the lower priced goods, and is another argument for purchasing the most concentrated material offered. It is interesting at this point to compare the amounts of plant food guaranteed to be sold for $15 in some of the leading fertilizers during the year. The sum of $15 is selected, because it was calculated from the Census of 1900, and the current prices of fertilizers; that it was the average amount spent annually for fertilizers by each farmer in the state.

AMOUNTS OF PLANT-FOOD BOUGHT FOR $15.00.

Prices per ton.	Per cent. nitrogen.	Per cent. phos. acid.	Per cent. potash.	Pounds fertilizers.	Pounds nitrogen.	Pounds phos. acid.	Pounds potash.
$40.00	3.3	10.	7.	750	24⅞	75.	52½
40.00	3.3	8.	7.	750	24⅞	60.	52½
40.00	3.3	6.	10.	750	24⅞	45.	75
40.00	3.7	7.	8.5	750	27⅞	52½	63⅞
33.00	2 5	9.	2.	909	22⅞	8'⅛	18.1
33.00	2.5	6.	5.	909	22⅞	51½	45½
30.00	2.0	8.	1.5	1,000	20	80	15
30.00	2.0	8.	3.	1,000	20	80	30
28.00	1.	8.	2.	1,071	10.7	85.7	21½

It is easy to see by this method of comparison that the man who bought the $40-fertilizer got more nitrogen, phosphoric acid and potash for his money than he who bought any cheaper brands, and he who bought the lowest priced goods got least for his money.

Composition of Commercial Fertilizers Sampled and Analyzed in 1908.

MANUFACTURER AND BRAND.	Nitrogen.				Phosphoric Acid.							Potash.	
			Total.				Available.			Total.			
	Inorganic.	Organic.	Found.	Guaranteed.	Soluble.	Reverted.	Found.	Guaranteed.	Insoluble.	Found.	Guaranteed.	Found.	Guaranteed.
Abbott & Martin Co.													
Harvest King	.....	1.05	1.05	1·20	3.55	5.43	8.98	8	1.62	10.60	.....	4.06	2
Abbott's Tobacco and Potato Special	.....	1.19	1.19	1.65	5.35	2.45	7.80	8	1.05	8.85	.....	6.42	4
American Agricultural Chemical Co.													
Bradley's Complete Manure with 10 % Potash	1.91	1.76	3.67	3·30	5.30	1.75	7.05	6	2.25	9.30	7	9.97	10
Bradley's Complete Manure for Top Dressing	5.14	.....	5.14	4·94	2.20	4.73	6.93	5	1.07	8.00	6	2.78	2·5
Bradley's Corn Phosphate	.55	1.39	1.94	2·06	6.80	1.53	8.33	8	2.37	10.70	10	1.92	1·5
Bradley's Eclipse Phosphate	.....	1.52	1.52	1·03	6.50	1.98	8.48	8	2.47	10.95	10	2.22	2·0
Bradley's Potato Fertilizer	.68	1.16	1.84	2·06	4.55	2.63	7.18	8	3.27	10.45	10	3.59	3·0
Bradley's Seeding Down Manure	1.31	1.27	2.58	2·5	7.05	1.53	8.58	9	2.15	10.73	11	2.47	2
Bradley's XL. Superphosphate	1.20	1.28	2.48	2·5	6.55	2.13	8.68	9	2.77	11.45	11	2.34	2
Clark's Cove Bay State Fertilizer, G. G	.59	1.26	1.85	2·06	6 60	1.13	7.73	8	2.47	10.20	10	1.90	1·5
Clark's Cove Potato Fertilizer	.66	1.31	1.97	2·06	3.00	4.68	7.68	8	2.52	10.20	10	3.32	3
Cleveland Fertilizer for all Crops	.....	1.12	1.12	1·03	6.60	2.38	8.98	8	2.12	11.10	10	2.43	2
Cleveland Potato Phosphate	.89	1.13	2.02	2·06	4.55	2.95	7.50	8	2.75	10.25	10	3.29	3
Cleveland Superphosphate	.46	1.91	2.37	2·06	4.35	3.58	7.93	8	2.67	10.60	10	2.34	1·5
Crocker's Corn Phosphate	.54	1.44	1.98	2·06	5.90	2.25	8.15	8	1.85	10.00	9	1.97	1·5
Crocker's Grass and Oats Fertilizer	.....	.....	.....	.....	7.10	3.65	10.75	11	1.50	12.25	.....	2.21	2
Crocker's New Rival Ammoniated Superphosphate	.....	1.25	1.25	1·03	6.10	2.88	8.98	8	2.42	11 40	.....	2.43	2
Crocker's Potato, Hop and Tobacco	.88	1.02	1.90	2·06	4.50	3.28	7.78	8	2.27	10.05	.....	3.78	3
Crocker's Special Potato Manure	1.46	1.95	3.41	3·3	4.80	2.00	6.80	6	2.07	8 87	.....	9 62	10
Cumberland Guano for all Crops	.....	1.26	1.26	1·03	7.15	1.55	8.70	8	1.65	10.35	10	2.31	2
Cumberland Potato Fertilizer	.87	1.19	2.06	2·06	6.30	3.20	9.50	8	2.10	11.60	10	3.29	3
Cumberland Superphosphate	.42	1.65	2.07	2·06	7.05	1.23	8 28	8	1.87	10.15	10	1.83	1·5
Great Eastern Potato Manure	.75	1.87	2.02	2·06	6.90	1 20	8.10	8	2.25	10.35	10	3.26	3
Great Eastern General Fertilizer	.....	.....	1.69	.82	4.90	2.85	7.75	8	2.55	10.30	...	2.75	4
Great Eastern Garden Special	1.16	1.90	3.06	3·3	3.60	4.60	8.20	8	1.45	9.65	9	7.36	7
Great Eastern Grass and Oats Fertilizer	.....	.....	.....	.....	3 48	7.22	10.70	11	2.25	12.95	.....	2.13	2

Great Eastern Northern Corn Special	.59	1.29	1.88	2.06	5.75	2.10	7.85	8	2.10	10.25	.....	1.93	1.5
Darling's Blood, Bone and Potash	1.65	3.34	4.99	4.1	4.65	2.10	6.75	7	1.65	8.40	8	7.33	7
Darling's General Fertilizer	.....	1.47	1.47	1.25	5.05	2.35	7.40	6	2.80	10.20	7	4.76	3
Darling's Potato Manure	.68	2.07	2.75	2.5	4.85	2.65	7.50	6	2.07	9.57	8	5.27	5
High grade Fertilizer with 10 per cent. Potash	.68	1.65	2.33	2.4	5.00	1.33	6.33	6	2.87	9.20	7	9.83	10
Pacific Potato Special	.83	1.19	2.02	2.06	5.25	2.35	7.60	8	2.85	10.45	10	3.44	3
Packer's Union Animal Corn Fertilizer	.57	1.91	2.48	2.47	5.55	2.20	7.75	9	2.75	10.50	.....	2.47	2
Packer's Union Gardner's Complete Manure	.89	1.47	2.36	2.47	4.25	2.05	6.30	6	2.15	8.45	.....	8.52	10
Packer's Union Potato Manure	.53	1.39	1.92	2.06	2.90	4.48	7.38	8	2.22	9.60	.....	4.40	6
Packer's Union Universal Fertilizer	.....	1.49	1.49	.82	6.00	2.35	8.35	8	2.10	10.45	10	4.38	4
Packer's Union Wheat, Oats and Clover Fertilizer	.....	.....	.....	.....	5.75	4.74	10.49	11	1.66	12.15	.....	2.04	2.0
Quinnipiac Corn Manure	.49	1.68	2.17	2.06	5.45	3.80	9.25	8	2.30	11.55	10	1.95	1.5
Quinnipiac Potato Phosphate	.57	1.39	1.96	2.06	5.75	3.00	8.75	8	2.52	11.27	10	1.46	3
Read's Farmer's Friend	.56	1.37	1.93	2.06	5.45	2.23	7.68	8	2.07	9.75	10	3.45	3
Read's Potato Manure	.95	1.98	2.93	2.4	3.80	1.90	5.70	6	2.20	7.90	7	9.73	10
Read's Practical Potato Special	.....	1.50	1.50	.82	4.95	2.38	7.33	4	2.42	9.75	5	5.99	8
Read's Standard Superphosphate	.....	1.36	1.36	.82	3.30	3.73	7.03	8	2.87	9.90	10	5.16	4
Read's Vegetable and Vine Fertilizer	.76	1.24	2.00	2.06	3.00	4.95	7.95	8	2.00	9.95	10	8.08	6
Soluble Pacific Guano	.67	1.44	2.11	2.06	6.20	2.83	9.03	8	1.92	10.95	10	2.40	1.5
Williams & Clark Americus Corn Phosphate	.63	1.25	1.88	2.06	6.90	1.10	8.00	8	2.30	10.30	10	2.03	1.5
Williams & Clark Americus Potato Manure	.51	1.42	1.93	2.06	6.10	2.13	8.23	8	2.57	10.80	10	3.52	3
William's & Clark Americus Prolific Crop Producer	.....	1.32	1.32	.82	3.35	5.50	8.85	7	2.05	10.90	8	1.26	1
Muriate of Potash	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	51.0	50.
Nitrate of Soda	.....	.....	15.10	15.	.....	.....	.....	.....	.....	.....	.....	.....	.....
Plain Superphosphate	.....	.....	.....	.....	10.90	4.15	15.05	14.	1.25	16.30	.....	.....	.....
Bowker Fertilizer Co.													
Bowker's Corn Phosphate	.59	1.01	1.60	1.65	6.60	1.95	8.55	8	2.10	10.65	9	2.39	2
Bowker's Farm and Garden Phosphate	.54	.96	1.50	1.65	6.20	1.78	7.98	8	2.32	10.30	9	2.38	2
Bowker's Hill and Drill Phosphate	1.16	1.21	2.37	2.47	6.95	2.18	9.13	9	2.52	11.65	10	2.29	2
Bowker's Market Garden Fertilizer	.69	1.68	2.37	2.47	3.90	2.37	6.27	6	2.43	8.70	7	9.87	10
Bowker's Potash or Staple Phosphate	.....	1.47	1.47	.82	7.65	1.25	8.90	8	1.45	10.35	9	3.57	3
Bowker's Potato and Vegetable Fertilizer	.91	1.22	2.13	2.47	6.00	2.70	8.70	8	1.90	10.60	9	3.83	4
Bowker's Potato and Vegetable Phosphate	.54	1.58	2.12	1.65	6.10	2.10	8.20	8	2.05	10.25	9	2.37	2
Bowker's Superphosphate with Potash	.....	.....	.....	.....	5.85	4.05	9.90	10	2.30	12.20	11	2.02	2
Bowker's Sure Crop Phosphate	.....	1.17	1.17	.82	5.05	4.30	9.35	8	1.20	10.55	9	1.98	2.0
Stockbridge Manure for Potatoes and Vegetables	1.06	2.48	3.54	3.3	5.10	1.95	7.05	6	1.65	8.70	7	9.60	10
Coe-Mortimer Co.													
E. Frank Coe's Celebrated Special Potato Fertilizer	.....	1.60	1.60	1.65	5.80	3.00	8.80	8	1.45	10.25	10	4.19	4
E. Frank Coe's Columbian Corn and Potato Fertilizer	.47	1.10	1.57	1.23	3.95	4.70	8.65	8.5	1.55	10.20	10.5	2.60	2.5
E. Frank Coe's New England Corn and Potato Fertilizer	.....	1.02	1.02	.80	3.45	4.58	8.03	7.5	1.27	9.30	9	4.01	3
E. Frank Coe's XXV Ammoniated Bone Phosphate	.....	1.42	1.42	.80	4.30	3.73	8.03	8.5	1.07	9.10	10	2.67	1.5

Composition of Commercial Fertilizers Sampled and Analyzed in 1908.—Concluded.

MANUFACTURER AND BRAND.	Nitrogen.				Phosphoric Acid.							Potash.	
			Total.				Available.			Total.			
	Inorganic.	Organic.	Found.	Guaranteed.	Soluble.	Reverted.	Found.	Guaranteed.	Insoluble.	Found.	Guaranteed.	Found.	Guaranteed.
Essex Fertilizer Company.													
Essex Complete Manure for Corn and Grain	.80	2.26	3.06	3.25	4.45	2.93	7.38	7	3.07	10.45	9.5	9.64	10
Essex Complete Manure for Potatoes and Vegetables	1.35	2.75	4.10	3.25	3.75	3.48	7.23	6	5.92	13.15	7	9.10	10
Essex XXX Fish and Potash	.47	1.79	2.26	2.	0.95	6.35	7.30	8	6.90	14.20	9	2.40	3
Essex XXX Fish and Potash	.....	.....	2.65	.....	1.15	6.38	7.53	.. ..	6.32	13.85	.....	2.65	.....
Lister's Agricultural Chemical Works.													
Lister's Animal Bone and Potash	.....	.....	.....	.....	4.00	5.78	9.78	10	2.52	12.30	11	2.63	2
Lister's Potato Manure	1.34	1.34	2.68	3.3	5.95	2.15	8.10	8	1.90	10.00	9	7.14.	7
Lister's Oneida Special	.....	1.69	1.69	.83	6.70	1.98	8.68	7	2.22	10.90	8	2.35	1
Lister's Special Corn Fertilizer	.82	1.30	2.12	1.65	5.50	2.45	7.95	8	2.20	10.15	9	3.93	3
Lister's Special Potato Fertilizer	.45	1.20	1.65	1.65	5.15	2.33	7.48	8	1.92	9.40	9	4.70	3
Lister's Success Fertilizer	.70	1.04	1.74	1.24	4.85	3.50	8.35	9	2.35	10.70	11	2.19	2
New England Fertilizer Co.													
Corn and Grain Fertilizer	.....	1.15	1.15	1.22	5.65	2.05	7.70	7	.50	8.20	8	2.49	2
Potato Fertilizer	.....	1.88	1.88	1.64	4.35	3.34	7.69	7	3.86	11.55	8	4.87	4
Parmenter & Polsey Fertilizer Co.													
Plymouth Rock Brand	.....	2.62	2.62	2.46	4.85	3.33	8.18	8	2.97	11.15	10	4.33	4
J. W. Sanborn.													
Sanborn's Grass and Grain	3.89	1.56	5.45	5.10	1.35	3.50	4.85	4.75	4.07	8.92	7.25	7.29	6.15
Sanborn's Hill and Drill	1.26	1.03	2.29	2.45	2.52	3.43	5.95	7.5	9.25	15.20	15.	4.20	3.75
Sanborn's Special Potato and Corn	1.45	2.19	3.64	3.45	6.25	2.10	8.35	8.	2.52	10.87	9.5	7.15	7.8

Swift's Lowell Fertilizer Co.													
Swift's Lowell Bone Fertilizer	.....	1.90	1.90	1.64	4.85	2.45	7.30	8	1.85	9 15	9	3.39	3
Swift's Lowell Cereal Fertilizer	.....	.93	.93	.82	4.55	2.23	6.78	7	.92	7.70	8	1.47	1
Swift's Lowell Empress Brand	.....	1.36	1.36	1.23	4.90	2.05	6.95	7	1.35	8.30	8	2.89	2
Swift's Lowell Potato Manure	.....	1.91	1.91	1.64	5.70	2.28	7.98	7	1.37	9.35	8	4.38	4
Swift's Lowell Potato Phosphate	.38	2.38	2.76	2.46	6.70	1.33	8.03	8	1.57	9.60	9	6.27	6
Swift's Special Grass Mixture	.....	3.90	3.90	4.10	4.60	3.25	7.85	7	1.95	9 80	8	6.38	6
Swift's Superior Fertilizer	1.64	2.21	3.85	3.69	4.80	2.08	6.88	7	.97	7.85	8	9.20	10

TRADE VALUES OF FERTILIZING INGREDIENTS IN RAW MATERIALS AND CHEMICALS, 1908.

	Cents per. pound.
Nitrogen in ammonia salts	17.5
" nitrates	18.5
" dry and fine ground fish, meat and blood, and in high grade mixed fertilizers	20.5
" fine ground bone and tankage	20.5
" medium ground bone and tankage	15.
Phosphoric acid soluble in water	5.
" " " ammonium citrate (reverted)	4.5
" " in fine ground bone, fish and tankage	4.
" " in coarse bone and tankage	3.
" " in cottonseed meal, castor-pomace, and wood ashes	4.
" " insoluble in mixed fertilizers	2.
Potash as sulphate free from chlorides and in wood ashes	5.
Potash as muriate	4.25

The above values are based on the wholesale market price for the materials, when sold in large lots at the principal trade centers in New England. The valuation of a ton of any mixed fertilizer based on the above figures will usually fall ten dollars below the retail price at the local agency. This variation includes such fixed charges as cost of mixing, bags, cartage, and freight, salaries and commissions of agents, and interest.

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